

CLAIMS

What is claimed is:

- 1 1. (currently amended) A method for fabricating a write pole tip for perpendicular
2 recording, comprising:
 - 3 A) fabricating ~~the~~ a P1 pole, coils and a P2 flux shaping layer;
 - 4 B) depositing ~~the~~ a P3 layer on said P2 flux shaping layer;
 - 5 C) depositing a CMP stop layer on said P3 layer;
 - 6 D) depositing at least one sacrificial layer on said CMP stop layer;
 - 7 E) shaping said P3 layer into P3 pole tip;
 - 8 F) removing said at least one sacrificial layer to leave said P3 pole tip; and
 - 9 G) encapsulating said P3 pole tip in a protective layer.
- 1 2. (original) The method of claim 1, wherein:
2 said P3 layer material of B) is a material chosen from the group consisting of
3 CoFe, CoFeN, NiFe, CoFe alloys, CoFeN alloys, NiFe alloys, Cr, Al₂O₃, and Ru.
- 1 3. (original) The method of claim 1, wherein:
2 said CMP stop layer material of C) is a material chosen from the group consisting
3 of Al₂O₃, Ta₂O₅, SiO_xN_y, Al₂O₃ alloys, Ta₂O₅ alloys, SiO_xN_y alloys and insulation
4 materials.
- 1 4. (original) The method of claim 1, wherein:
2 said at least one sacrificial layer of D) comprises a sacrificial layer PS of
3 sacrificial material chosen from the group consisting of NiFe, NiP and plated materials
4 with high ion milling resistances.
- 1 5.(original) The method of claim 4, wherein:
2 said at least one sacrificial layer of D) further comprises a seed layer of sacrificial
3 material.
- 1 6. (currently amended) The method of claim 5, wherein:
2 said PS at least one sacrificial layer is formed by creating a cavity surrounded by
3 photo-resist material, said cavity then being filled with sacrificial material.
- 1 7.(original) The method of claim 1, wherein:
2 said shaping of said P3 layer of E) is done by ion milling.
- 1 8. (currently amended) The method of claim 7, wherein:
2 said ion milling is done to first produce a straight-sided structure, as said PS at
3 least one sacrificial layer masks said P3 pole tip, and then said CMP stop layer acts as a
4 secondary mask as ion milling is used to bevel the sides of said P3 pole tip.

- 1 9. (original) The method of claim 8, wherein:
2 said beveled sides of said P3 pole tip are beveled to an angle with the range of 8
3 degrees to 15 degrees.
- 1 10. (original) The method of claim 1, wherein:
2 said finished P3 pole tip has a width less than 200 nm.
- 1 11. (withdrawn) The method of claim 1, wherein:
2 said removing of said at least one sacrificial layer of F) further comprises
3 removing said CMP stop layer.
- 1 12. (withdrawn) The method of claim 11, wherein:
2 said removing of said CMP stop layer comprises using Chemical Mechanical
3 Polishing.
- 1 13. (original) The method of claim 1, wherein:
2 said encapsulating material of G) comprises material matching that of said CMP
3 stop layer.
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- 1 14. (withdrawn) The method of claim 1, wherein:
2 said at least one sacrificial layer of D) comprises magnetic material; and
3 said removing said at least one sacrificial layer of F) requires that all of said
4 magnetic material of said at least one sacrificial layer be completely removed.